

I – Identification of the Substance and of the Company

SUPPLIER: RMO, Inc.
650 W. Colfax Ave.
Denver, CO 80204
303-592-8200

Trade Name and Synonyms –
Description: Dual Top Anchor System
Screws, Liberty Bielle Fixed Hex Screw,
RM Lock Replacement Screw

Emergency Information Chemtrec: 800-424-9300
Chemtrec International: 202-483-7616

Product Grade / Name:

TITANIUM

II – Composition / Information on Ingredients

<u>Chemical Components</u>	<u>Weight (%)</u>	<u>C.A.S. No.</u>	<u>Exposure Limits</u>	
			<u>OSHA PEL (mg/M³)</u>	<u>TLV-TWA (mg/M³)</u>
Aluminum (as dust)	0 – 8	7429-90-5	15	10
(as fume)			5	5
Carbon	0 – 0.1	1333-86-4	3.5	3.5
Chromium	0 – 11	7440-47-3	1	0.5
Copper (as dust)	0 – 0.2	7440-58-8	1	1
(as fume)			0.1	0.2
Iron (oxide as fume)	0 – 0.42	1309-37-1	10	5
Molybdenum	0 – 12	7439-98-7	15	10
Tantalum	0 – 1	7440-25-7	5	5
Tin	0 – 3	7440-31-5	2	2
Titanium (as oxide)	0 – 5	13463-67-7	15	10
Vanadium (as dust)	0 – 5.15	1314-62-1	0.5	0.05
(as fume)			0.1	0.05
Zirconium	0 – 4	7440-67-7	5	5

No permissible exposure limits (PEL) or threshold limit values (TLV) exist for titanium.

Values shown are applicable to component elements.

III – Hazards Identification

This product does not constitute a physical health hazard in the form that it is supplied. However, operations such as abrading, burning, welding, sawing, brazing, grinding, cutting, polishing, machining, etc. which result in elevating the temperature of the product to or above its melting point or results in the generation of airborne particulate, may present health hazards.

There is no evidence of a health hazard from inhalation or titanium dioxide in concentrations not exceeding 10 mg/m. The toxicity of titanium dioxide has been found to be relatively inert. Skin contact with titanium dusts may cause physical abrasion. Eye contact with metallic materials has shown particulate irritation.

Chromium metal dust, ore, and various chemical compounds have been identified as

suspect human carcinogens by the IARC, NTP Annual report. We believe there are no scientific studies that show increased incidence of cancer or other disease due to exposure to the form of chromium, or other elements, as incorporated in titanium products.

Exposure to fumes and dusts can cause respiratory irritation, skin pallor, chest pain, cough, dyspnea, palpitation, lung changes due to the effects of one or more of the elements present consistent with adverse health effects associated with the listed constituents in excess of OSHA permissible exposure limits established. Prolonged overexposure to alloy dusts or fumes may cause skin, eye, throat or nose irritations, leading to pulmonary disease.

Possible signs and symptoms of exposure to dust, welding fume, and gases:

Short Term Exposure: Metallic taste; nausea; tightness of chest; irritation of eyes, nose, throat and skin; loss of consciousness / death due to welding gases or lack of oxygen.

Log Term Exposure: Adverse effects may or may not result from long-term (chronic) exposures to dust, fume, gases, etc. that occur by way of subsequent operations on the product. Some studies would associate one or more of the constituents (per section II) with the potential for neurological, pulmonary, respiratory, skin, or other disease. Chromium in various chemical compounds has been identified as suspect human carcinogens by the IARC, NTP Annual Report.

Aggravation of pre-existing respiratory or allergic conditions may occur in some people.

IV – First Aid Measures

<u>Primary Routes of Entry:</u>	<u>Emergency First Aid:</u>
Inhalation	Remove to fresh air, if condition continues, consult physician.
Eye Contact	Flush well with running water to remove particulates, get medical attention.
Skin Contact	Brush off excess dust. Wash area well with soap and water.
Ingestion	Seek medical help if large quantities of material have been ingested.

See Section II for lists of specific component exposure limits.

V – Fire Fighting Measures

Titanium / titanium alloy products in the form supplied are not considered combustible. However, subsequent processing (cutting, welding, grinding, or polishing, etc., in the absence of oxygen) may result in finely divided waste which is ignitable, and which may present fire and explosion hazards.

Note: Molten metal will react violently with water. If ignited, use dry chemical fire extinguisher, never water (explosion hazard).

VI – Accidental Release Measures

Fine material should be swept or vacuumed. Avoid using compressed air to maneuver spills or leaks of dusty materials to avoid eye contamination.

VII – Handling and Storage

Use good housekeeping procedures to prevent accumulation of dusts, thus minimizing airborne dust concentrations.

VIII – Exposure Controls / Personal Protection

Ventilation Requirements:

General – Recommended keeping airborne concentration of dust / fumes below ACGIH TLV's.

Personal Protective Equipment:

Respiratory Protection:

If fumes, misting or dust conditions occurs and exceed applicable OSHA Standards.

Personal Protection:

Respiratory:

If fumes, misting or dust conditions occur and exceed applicable OSHA Standards, provide NIOSH approved air-supplied respirators.

Eye Protection:

Recommend approved safety glasses / goggles when grinding, welding, etc.

Hand Protection:

Gloves: As required.

Other Clothing: As required.

IX – Physical and Chemical Properties

Melting Point: 1560 – 1840°C

Vapor Pressure: N/A

Appearance and Odor: Solid odorless metal

Specific Gravity: Approximately 4.5 – 5.5

Vapor Density: N/A

Solubility in Water: Insoluble

Evaporation Rate: N/A

X – Stability and Reactivity

Stability:

Unstable () Stable (X)

Conditions to Avoid: Avoid generation of airborne dust which presents moderate fire and explosion hazards. Molten metal will react violently with water.

Incompatibility:

Material to Avoid: Acids, bases, and oxidizers. Prevent buildups.

XI – Toxicological Information

The toxicity of titanium dioxide has been found to be relatively inert. No toxic effect would be expected from exposure to the solid form of titanium products. Prolonged, repeated exposure to fumes or dust generated during subsequent operations may or may not cause adverse health effects associated with the listed constituents in excess of OSHA permissible exposure limits established in 29CFR Part 2920.1200 (See Section 2. Generic Ingredients). Chromium metal dust, ore, and various chemical compounds have been identified as suspect human carcinogens by the IARC, NTP

Annual report. We believe there are no scientific studies that show increased incidence of cancer or other disease due to exposure to the form of chromium, or other elements, as incorporated in titanium products.

XII – Ecological Information

No ecological effects are known.

XIII – Disposal Considerations

Dispose of in accordance with applicable Federal, State, and Local Regulations. Scrap metal can be reclaimed for reuse.

XIV – Transportation Information

Technical Shipping Name: Not regulated
Freight Class Bulk: N/A
Freight Class Package: N/A
Product Label: N/A
Hazard Class or Division: Non-Hazardous
Hazard Class Division Number: Not Hazardous by D.O.T. Regulations

XV – Regulatory Information

These products are manufactured using Good Manufacturing Practices and are regulated as Class II Medical Devices by the U.S. Food and Drug Administration, Class III by the Canada CMDR, and Class IIa by the Medical Device Directive 93/42 EEC for the European Community.

XVI – Other Information

Note: While the information and recommendations set forth on this data sheet are believed to be accurate as received from our suppliers, RMO, Inc. makes no warranty with respect thereto and disclaims all liability from reliance thereon.